

Investigating the Factors Influencing RFID Adoption Intentions of Retailers: Evidences from Lahore-Pakistan

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Abstract

Although there have been many articles emphasizing the common remunerations of the RFID implementation in the supply chain but the progression of instigating the equipment for the administration tenacity is somewhat on the leisurelier side particularly in likes of Pakistan and other under developed realms. The perseverance of the investigation is to accomplish a scrutiny of the administrative issues which stimulus the RFID implementation intents. The investigation is to be conducted by the mean of a statistical study of the numbers congregated over an opinion poll through different retailers in the Lahore region. The inquiry is done with the assistance of SPSS and for this perseverance the questionnaire is alienated in agreement to some variables explicitly technology competence, social issues and competitive pressure. The emphasis group for the study is the retail industry as it is supposed to be the most conspicuous field which can develop the maximum improvement from the RFID technology espousal. This research would benefit in enhanced understanding of the aspects impelling the RFID implementation aims on the administrative foundation.

Keywords: RFID, Adoption Intentions, Retailers, Supply Chain, SPSS

Introduction

Now days, retail industry faces copious challenges and colossal competition in the market. The presence of the technologies like bar code seem to be getting out dated and less competitive with the growing market needs. The presence of the bar code technology has failed to prevent some of the daily life failures like “Stock Out” and “Inventory Mismanagement”. We are living in the era of global world where the likes of the technologies resembling RFID has shown tremendous potential during the last few years especially in the developed countries. This hype in the field of the technology is expected to take over the barcode system in the near future given its benefits and potential (Alqahtani et. al 2012).

RFID is the new age version of barcodes and possibly beyond that. A small electronic chip (size of a grain of rice) that can be placed in the object which is to be identified and an antenna/reader to detect the presence of the particular object and provide the necessary information. RFID use is increasing in the supply chains as it does not require the direct contact and much more information can be stored compared to a conventional barcode (Aljawaheri et. al 2012).

Therefore a new market has been created given the need of efficient management of cost and highly precise management of the assets. Unfortunately in Pakistan the use of RFID technology is pretty immature and the need of the hour is to focus on this emerging technology and deploying it in

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our industry to extract the maximum benefits, as RFID is just not a tracking device but lot more than that. The purpose of conducting the research is to elaborate the usefulness of this technology and highlight the factors which are playing their role in affecting RFID implementation intention in Pakistan retail industry. In present times the competition in the market has taken the supply chain management to the new horizons in order to fulfill the desire of the customers. RFID can simply introduce a new approach of management by revolutionizing the methods by which the inventories are handled and other tracking tasks are performed.

In Pakistan the implementation of RFID is on the slower side but as for the other countries which have adopted this technology the introduction phase of the technology has been influenced by numerous factors, most importantly by the benefits which the management aims to achieve by the implementation. In this research the researcher tries to find those factors which influence the implementation intentions of the managers/ companies or in other words the perceived benefits that are expected to be achieved. Despite all these previously mentioned advantages of the RFID almost minor research have been done in this identical area in Pakistan and a big gap exist in the literature which is needed to be explored (Wamba et. al 2013).

The research tries to find the key influencing factors of the RFID implementation intentions in the supply chain management in Lahore retail industry.

Literature Review

As for the available texts analysis the files were serene majorly from three chief cradles to be exact Google Scholar, Science Direct and Google itself. The hunt keywords were “RFID”, “RFID Barriers”, “RFID Intentions”, “and RFID Implementation” and “Retail” was the subsidiary keyword for this resolve. A bulky number of articles were accessible online which were taken and concerted in an epidemic folder. About 70-80 exploration articles, a number of reports, newspapers, and pertinent cradles have been referred to get in profundity understanding research area. The author has tried best to get thorough going related from the latest and updated investigation related to the scope of the study. These unruffled articles were then taken under a nippy literature appraisal for the perseverance of preliminary inspection and all those qualifications which were not related to the very investigation area were excluded and only those articles which were having theme alike to research expanse were congregated and organized in a consistent routine. The articles that were gone after the initial examination were about 45 in quantity which chiefly encompassed study papers and scarce thesis works. The research papers were about 33 in quantity whereas the thesis slog totaled to 12.

Whenever new machinery is familiarized in the fair a lot of encounters wait for it and during its life cycle diverse types of encounters transpire that thwart the enactment in express way. As a result of these encumbering factors the implementation rate decays and the paybacks of the new equipment are not suitably pronounced. So identical is the situation with the RFID technology implementation evolving countries like Pakistan. RFID equipment is not a new one as its inauguration ongoing way back in the 1970s, but its embracing in the international supply chain is still in the early stages almost in all emergent countries (Aljawaheri et. al 2012).

Lot of studies has been steered in the field and many researchers have played their share emphasizing the impending welfares of this new equipment. The new knowledge enactment progression in a firm flinches with the objectives of the institute to accomplish the professed assistances, then the barricades to the implementation comes into play and as a final point the precarious victory dynamics when acted upon gives us the thorough going potential benefit (Wamba et. al 2013). From the literature review the investigator saw that most of these investigates whether on the implementation intentions or on the barricades have been accompanied in the industrialized

countries like USA (Attaran et. al 2012), Australia (Huber et. al 2007), New Zealand (Soon et. al 2008), Saudi Arabia (Alqahtani et. al 2012), Sweden (Aljawaheri et. al 2012) and China (Chen et. al 2014). Most of the research papers have been pointing the literature assessment as their mean of gathering the statistics and investigating it using the qualitative approach (Tsai et. al 2013).

The literature also discovered that not a single study has been directed in the framework of Pakistan expressly with repute to the implementation barriers of RFID Technology in retail sector (Wamba et. al 2013). Thus, it is domineering to fill this gap in academic perspective for better supervision of the sector practically by conducting a wide-ranging study (Wamba et. al 2013). Therefore, this research will be conducted to discover the association and impression of most critical issues” that have noteworthy influence on the aims of major retailers operational in metropolitan areas of the Pakistan with regard to RFID implementation in their supply chain administration elements by consuming the numerical research method after collecting the rejoinders through field survey. This research will also emphasis the affiliation of various inter-organizational extents in the direction of RFID implementation purposes.

Research objectives

The range for the study is defined by the intentions of the research i.e. what you want to accomplish (Icobussi et. al 2009). As far as this research goes, the main objective of this research is to determine the major factors, their affiliation and affect that influence the RFID implementation intentions in the retail industry. The sub-objectives of this research include identify and measure the relationship and impact of:

- Technology competence and RFID implementation intentions of retailers.
- Competitive pressure and RFID implementation intentions of retailers
- Social Issues and RFID implementation intentions of retailers.

Hypothesis development and theoretical framework

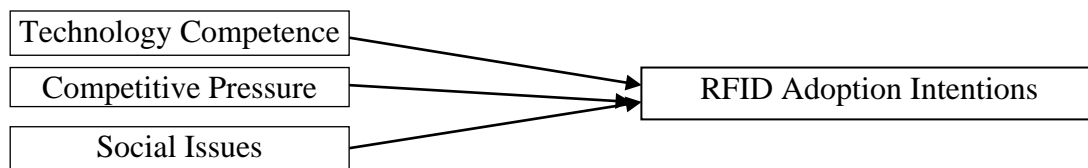


Figure 1: Theoretical Framework

All the hypotheses have sovereign variables involving with the subject of examination and a imaginable optimistic relation is pursued through the data collection. The gathering of figures would be done through the feedback form and retailer’s point of view would be assembled not only about the sovereign variables but also about the items involved. The researcher will converse all the sovereign variables and their items one by one for the proper empathetic of the subject.

H1. Technology competence and intentions towards RFID implementation has a positive relationship.

H2. Competitive pressure and intentions towards RFID implementation has a positive relationship.

H3. Social Issues and intentions towards RFID implementation have a positive relationship.

Methodology

In their book Hussey and Collis (2003) mentions the positivism approach being a theory which can be scientifically used to analyze the communal behavior toward the new trending technologies. Keeping in view that suggestion we have employed the positivism methodology and

have used the quantitative analysis to judge the credibility of hypothesizes. So for the purpose of the data collection we have taken a pre-used questionnaire previously being employed by Wang et al. (2010), Cheng et al. (2010), Tsai et al. (2012) and Salem et al. (2012). Same independent variables along with the items that have been employed are taken for the designing of the questionnaire. The questionnaire consists of three variables which are independent namely Technology Competence, Competitive Pressure and Social Issues while one dependent variable called the RFID adoption intentions. To measure the variables a scale has been used on a 5 point likert scale where we consider the 5 as Strongly Agree, 4 as Agree, 3 as Neutral, 2 as Disagree and 1 as Strongly Disagree.

As discussed already that the Retail industry was used as the population for the study and for the collection of the data the sample selection was done by the help of book Research methods for business students by Mark Saunders et al. (2011). The selection flow chart given by the author asked different questions and guided us to use the cluster sampling for the industry selection and then simple random sampling for the selection of the personnel from whom the data should be collected. The numbers of samples collected were nearly 200 and the .csv file was prepared which was then transferred to the SPSS file for further analysis. The nature of the data was cross-sectional as by definition it is the data which is collected during the same time frame which is fully in line to our collected data. This data collected which is cross-sectional in nature is transferred to the SPSS file and subject to the analysis for testing the authenticity of the data. The type of regression which has been employed is multiple regression which is used when the dependent variable is one and multiple independent variable are there in the questionnaire and also no moderating or mediating variable is there in the system. The software version SPSS 20 has been used for the sake of analysis of the data.

Results

The profile of the sample from which the data was gathered is summarized below in different categories on the basis of gender, age, qualification, experience and position in the organization shown in table 1.

Table 1: Demographic Frequency and Percentage

CATEGORY	FREQUENCY	PERCENTAGE (%)
Gender		
Male	218	92
Female	19	8
Age (yrs.)		
18-25	60	25.3
26-30	105	44.3
31-Above	72	30.4
Qualification		
Matric	70	29.5
Intermediate	72	30.4
Graduation	89	37.6
Post-Graduation	6	2.5
Experience (yrs.)		
0-5	57	24.1
6-10	85	35.9
Above 10	95	40.1
Position		
Owner	111	46.8
Management	126	53.2

Correlation

A statistical technique known as the “correlation” is famous technique employed to show the mutual relationship of the variables. This here is represented by Cronbach’s Alpha and according to our methodology its value has to be greater than the .400. As per the research system developed in 2011 the value tells about the correlation between different variables but does not specify the strength of relation.

Table 2: Correlation

	RFID Adoption Intentions
Pearson’s correlations	
Technology Competence	.611
Competitive Pressure	.659
Social Issues	.442

This table of Pearson’s correlation shows the relation between RFID Adoption Intention, Technology Competence, Competitive Pressure and Social Issues. The values signify that a significant and positive correlation between the independent variables and the dependent variable. The value of Cronbach’s Alpha equal to .611 indicates the strength of relation between the RFID adoption intentions and the technology competence. Similarly, the Pearson’s correlation value of Competitive pressure is 0.659 and for social issues is 0.442.

Model Summary

Table 3: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.750 ^a	.563	.557	.22675	.563	99.966	3	233	.000	2.564

a. Predictors: (Constant), Social Issues, Competitive Pressure, Technology Competence

b. Dependent Variable: RFID Adoption Intention

The table of model summary shows the result which signifies the relation between the independent variables and the dependent variable of RFID adoption intentions. The value of R square on the table shows that the 56 % variation in the RFID adoption intentions is due to the mentioned independent variables. As far as the fitness of the model is concerned the fitness is oddly high even more than the expected. The value of F=99.966 is very high and desirable. The Durbin Watson value of the data is 2.564 and show that there exist no autocorrelation in the data.

ANOVA

ANOVA table again signposts that the model is appropriate and substantial.

Table 4: ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	15.420	3	5.140	99.966	.000 ^b
	Residual	11.980	233	.051		
	Total	27.400	236			

a. Dependent Variable: RFID Adoption Intention

b. Predictors: (Constant), Social Issues, Competitive Pressure, Technology Competence

Coefficient Table

The coefficient table shows the regression coefficients and also the VIF values which are quite satisfactory and are well within the designated limits to specify the absence of multi collinearity in the data.

Table 5: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.140	.217		5.262	.000		
	Technology Competence	.290	.067	.336	4.333	.000	.311	3.213
	Competitive Pressure	.290	.059	.359	4.941	.000	.356	2.813
	Social Issues	.161	.052	.156	3.066	.002	.722	1.385

a. Dependent Variable: RFID Adoption Intention

Discussion

So the data analysis helps us to reach a consensus that the diffusion of the innovation is vital in realizing the adoption intention of the emerging technologies like RFID in the retail industry. The results have helped us find the important independent variables that have their say on the intentions towards the RFID adoption in the retail industry. The independent variables like technology competence, competitive pressure and social issues were found significantly related to the intention of the retailers considering the adoption of the RFID technology. Following are the results of hypotheses which were assumed as the base of the research study.

No	Hypothesis	Result
H1	Technology competence and intentions towards RFID implementation has a positive relationship.	Supported
H2	Competitive pressure and intentions towards RFID implementation has a positive relationship.	Supported
H3	Social issues and intentions towards RFID implementation have a positive relationship.	Supported

Conclusion and Future Research

From the data analysis it is evident that the variables like technology competence, competitive pressure and social issues are very vital in the context of Pakistani retail industry specifically in the city of Lahore which is also called the heart of Pakistan. The response gathering in specific was a very tough task given that the knowledge level of the retailers in the very area of RFID was very limited which signifies the need of the proper education of the retailers about the RFID. Also the scope of conducting further researches in this area is humongous as already mentioned in the literature review that negligible researches have been conducted in this very area. Also we know that empirical study has its own limitations and only quantifies the variables it addresses so there lays the scope of a qualitative study which covers the broader perspective. It is clear that the RFID technology is no longer a new born baby and its adoption is still very immature in Pakistan which points out to the possible barriers towards the adoption of the technology so a detailed study can be conducted elaborating the barriers in the implementation of the RFID technology. Similarly enlightening the inter-organizational factors and suggesting a series of critical success factor for the adoption of the RFID can be handy exercise. Also given the interest of the

governmental organizations a study can be conducted about the impact of governmental financial or technical support toward RFID adoption would be an interesting topic.

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